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10/665,183	09/17/2003	James M. Brenner	100201592-1	5565

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EXAMINER	
FIDLER, SHELBY LEE	
ART UNIT	**PAPER NUMBER**
2861	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/08/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/665,183	BRENNER, JAMES M.	
	Examiner	Art Unit	
	Shelby Fidler	2861	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 October 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *6-11 and 13-16* is/are allowed.

6)☒ Claim(s) *1-5,12 and 17-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *9/17/2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claim 18 recites the limitation "the device" in line 7 of the claim. There is insufficient antecedent basis for this limitation in the claim. For the purpose of examination, Examiner assumes that "the device" refers to the apparatus.

Claim 18 is objected to because of the following informalities: please change the semicolon at the end of line 4 to a colon. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 18, 22-24, and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Kimura et al. (US 6796627 B2).

Regarding claim 18:

Kimura et al. disclose an apparatus comprising:

a supply tank (9a-9d; Fig. 1);

a pump (21; Fig. 2);

a print cartridge (7a-7d; Fig. 1) having a printhead (6; Fig. 2) and a print cartridge reservoir (unreferenced space in subtank 7 containing float 31; Fig. 2);

interface electronics (control circuit of Fig. 16) coupling the print cartridge, the pump and the supply tank (Fig. 16); and

a set of computer executable instructions operable on the device to:

track an ink volume in the print cartridge reservoir (subtank consumed ink counter 109; col. 19, lines 16-18);

track an ink volume in the supply tank (main tank residual ink counter 110; col. 19, lines 57-59); and

transfer ink from the supply tank to the print cartridge reservoir via the pump (col. 2, lines 42-53) when an ink volume remaining in the supply tank (for the purpose of examination, "an ink volume" is read as a volume corresponding to the predetermined value A) substantially equals an ink volume used to refill the print cartridge reservoir (e.g. steps S13-S15 in Fig. 17 and col. 19, lines 25-33, 38-42).

Regarding claim 22:

Kimura et al. also disclose that a pumping session of the pump is operable to mix ink between the supply tank and the print cartridge reservoir (col. 5, lines 14-18).

Regarding claim 23:

Kimura et al. disclose an image forming device, comprising:

a processor (e.g. consumed ink amount calculator 107, Fig. 16);

a memory (coefficient provider 108) coupled to the processor (Fig. 16);

an ink transfer and tracking module (control circuit of Fig. 16) to:

track an ink volume in the print cartridge reservoir (col. 16, lines 61-63);

track an ink volume in the supply tank (col. 17, lines 10-13); and

transfer ink from the supply tank to the print cartridge reservoir (col. 5, lines 14-18) resulting from when a total ink volume remaining in the supply tank substantially equals an ink volume to refill the print cartridge reservoir (col. 5, lines 14-18 and col. 20, lines 1-8; the total ink volume in the supply tank is used to refill the cartridge reservoir at some point since the supply tank becomes empty).

Regarding claim 24:

Kimura et al. also disclose that the ink transfer and tracking module includes software to track print cartridge reservoir and supply tank ink volumes (ink counters 109 and 110 are based on results from calculator 107; Fig. 16) based on print job consumption (col. 16, lines 52-60).

Regarding claim 26:

Kimura et al. also disclose that the ink transfer and tracking module includes software to transfer ink from the supply tank to the print cartridge reservoir when the print cartridge is empty (col. 24, lines 52-58 and steps S42-44, Fig. 23).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-2, 12, 17, 27, 28, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cowger et al. (US 5788388) in view of Kimura et al. (US 6796627 B2).

Regarding claims 1 and 17:

Cowger et al. disclose a computer readable medium having a set of computer executable instructions thereon (col. 4, lines 55-57) for causing a device to perform a method for refilling a print cartridge reservoir (14; Fig. 3), comprising:

tracking an ink volume in the print cartridge reservoir (col. 4, lines 55-57);

refilling of the print cartridge reservoir from a supply tank (refill bottle; col. 6, lines 63-65) resulting from when the ink volume in the supply tank substantially equals an ink volume to refill the print cartridge reservoir to a predetermined level (col. 7, lines 1-7 shows that the refill bottle is n times the volume of the cartridge, and that the cartridge is refilled n times, while col. 6, lines 37-40 shows that refill occurs when the cartridge is empty; therefore, just before the nth refill, the volume in the ink refill bottle is substantially equal to the volume required to refill the cartridge).

Cowger et al. do not expressly disclose the step of tracking an ink volume in a supply tank.

However, Kimura et al. disclose the step of tracking an ink volume in a supply tank (col. 17, lines 14-21).

Therefore, at the time of invention, it would have been obvious to a person of ordinary skill in the art to track the ink volume in the supply tank of Cowger et al. The motivation for doing so, as taught by Kimura et al., is to determine whether the supply tank is in an "ink end state" (col. 18, lines 11-19).

Regarding claim 2:

Cowger et al. also disclose that the step of tracking the ink volume in the print cartridge reservoir includes using software to track in consumption during print job processing (col. 4, lines 55-60).

Regarding claim 12:

Cowger et al. disclose a method for refilling a print cartridge reservoir (14; Fig. 3), comprising:

tracking an ink volume consumed from the print cartridge reservoir during print job processing (col. 4, lines 55-57);

refilling the print cartridge reservoir from a supply tank (refill bottle) when the print cartridge reservoir is empty (col. 6, lines 37-40, 63-65); and

refilling of the print cartridge reservoir resulting from when a remaining ink volume available in the supply tank substantially equals an ink volume consumed since a previous print cartridge reservoir refill (col. 7, lines 1-7 shows that the refill bottle is n times the volume of the cartridge, and that the cartridge is refilled n times; therefore each refill amount is equal to the volume of the cartridge. Just before the nth refill, the volume in the ink refill bottle would be substantially equal to the volume consumed since a previous refill).

Cowger et al. do not expressly disclose the step of tracking an ink volume in a supply tank.

However, Kimura et al. disclose the step of tracking an ink volume in a supply tank (col. 17, lines 14-21).

Therefore, at the time of invention, it would have been obvious to a person of ordinary skill in the art to track the ink volume in the supply tank of Cowger et al. The motivation for

doing so, as taught by Kimura et al., is to determine whether the supply tank is in an "ink end state" (col. 18, lines 11-19).

Regarding claim 27:

Cowger et al. disclose a printing device, comprising:

a processor (24);

a memory (20);

a print cartridge (12) having a printhead (32) and a print cartridge reservoir (14); and

interface electronics coupling the processor, the memory, and the print cartridge (Fig. 2);

means (drop counter) for tracking an ink volume in the print cartridge reservoir (col. 4, lines 55-58); and

means (obvious to col. 6, lines 63-65) for refilling the print cartridge reservoir from a supply tank resulting from when an ink volume remaining in the supply tank substantially equals an ink volume to refill the print cartridge reservoir to a predetermined level (col. 7, lines 1-7 shows that the refill bottle is n times the volume of the cartridge, and that the cartridge is refilled n times, while col. 6, lines 37-40 shows that refill occurs when the cartridge is empty; therefore, just before the nth refill, the volume in the ink refill bottle is substantially equal to the volume required to refill the cartridge).

Cowger et al. do not expressly disclose means for tracking an ink volume in a supply tank.

However, Kimura et al. disclose means (109) for tracking an ink volume in a supply tank (col. 17, lines 14-21).

Therefore, at the time of invention, it would have been obvious to a person of ordinary skill in the art to track the ink volume in the supply tank of Cowger et al. The motivation for

doing so, as taught by Kimura et al., is to determine whether the supply tank is in an "ink end state" (col. 18, lines 11-19).

Regarding claim 28:

Cowger et al. also disclose that the means for tracking ink volume in the print cartridge reservoir includes software for tracking ink volume consumption based on processed print jobs (col. 4, lines 55-58); and

Kimura et al. also disclose that the means for tracking ink volume in supply tank includes software for tracking ink volume consumption based on processed print jobs (col. 27, lines 16-18).

Regarding claim 30:

Cowger et al. disclose all the limitations of claim 27, as well as the limitation that the means for refilling the print cartridge reservoir from the supply tank when an ink volume remaining in the supply tank substantially equals an ink volume to refill the print cartridge reservoir to a predetermined level includes software operable to track an amount of ink consumed since a previous print cartridge reservoir refill (col. 4, lines 55-58).

Cowger et al. do not expressly disclose that the means for refilling the print cartridge reservoir from the supply tank when an ink volume remaining in the supply tank substantially equals an ink volume to refill the print cartridge reservoir to a predetermined level includes software operable to track a total ink volume remaining in the supply tank.

However, Kimura et al. disclose means for refilling the print cartridge reservoir from the supply tank that includes software (col. 17, lines 21-25) operable to track a total ink volume remaining in the supply tank (col. 17, lines 14-18) and an amount of ink consumed since a previous print cartridge reservoir refill (col. 16, line 61 - col. 17, line 6).

Therefore, at the time of invention, it would have been obvious to a person of ordinary skill in the art to track the ink volume in the supply tank of Cowger et al. The motivation for doing so, as taught by Kimura et al., is to determine whether the supply tank is in an "ink end state" (col. 18, lines 11-19).

Claims 3-5 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cowger et al. (US 5788388) as modified by Kimura et al. (US 6796627 B2), as applied to claim 1 above, and further in view of Farr et al. (US 6874861 B2).

Regarding claim 3:

Cowger et al. as modified by Kimura et al. disclose all claimed limitations except that the step of tracking the ink volume in the supply tank includes using software to track the ink volume transferred from the supply tank to a print cartridge reservoir.

However, Farr et al. disclose tracking an ink volume in a supply tank using software (col. 4, lines 26-30) that tracks the ink volume transferred from the supply tank to the print cartridge reservoir (col. 13, lines 35-42).

Therefore, at the time of invention, it would have been obvious to a person of ordinary skill in the art to the ink volume tracking techniques of Farr et al. into the invention of Cowger et al. as modified by Kimura et al. The motivation for doing so, as taught by Farr et al., is to determine characteristics of the printing fluid and a printing fluid level (col. 4, lines 2-10).

Regarding claim 4:

Farr et al. also disclose that the ink volume transferred is tracked using electrical probes (32, 34; Fig. 2) connected to a flexible conduit coupling the supply tank to the print cartridge reservoir (col. 3, lines 43-56 and Fig. 2).

Regarding claim 5:

Farr et al. also disclose tracking the ink volume (col. 13, lines 35-42) using an optical sensor (col. 1, lines 27-30).

Regarding claim 29:

Cowger et al. as modified by Kimura et al. disclose all claimed limitations except that the volume in the print cartridge reservoir and supply tank reservoir includes software for tracking ink volume transfer from the supply tank to the print cartridge reservoir.

However, Farr et al. disclose tracking ink volumes based on volume transfer from the supply tank to the print cartridge reservoir (col. 13, lines 35-44).

Therefore, at the time of invention, it would have been obvious to a person of ordinary skill in the art to use the ink volume tracking techniques of Farr et al. into the invention of Cowger et al. as modified by Kimura et al. The motivation for doing so, as taught by Farr et al., is to determine characteristics of the printing fluid and a printing fluid level (col. 4, lines 2-10).

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kimura et al. (US 6796627 B2) in view of Shibata et al. (US 5561453).

Regarding claim 19:

Kimura et al. disclose all the limitations of claim 18, as well as the limitation that ink is transferred from the supply tank to the print cartridge reservoir through a flexible conduit using a pump (col. 5, line 63 – col. 6, line 7 and col. 6, lines 15-19).

Kimura et al. do not expressly disclose that the pump is a peristaltic pump.

However, Shibata et al. disclose a pump that is a peristaltic pump (col. 4, lines 37-42)

Therefore, at the time of invention, it would have been obvious to a person of ordinary skill in the art to utilize a peristaltic pump into the invention of Kimura et al. The motivation for doing so, as taught by Shibata et al., is to urge the ink through tubing (col. 4, lines 37-42).

Claims 20 and 21 rejected under 35 U.S.C. 103(a) as being unpatentable over Kimura et al. (US 6796627 B2) as modified by Shibata et al. (US 5561453), as applied to claim 19 above, and further in view of Hahs et al. (US 5710579).

Regarding claim 20:

Kimura et al. as modified by Shibata et al. disclose all claimed limitations except that one or more sensors are positioned adjacent to the flexible conduit to detect a fluid and air mixture therein.

However, Hahs et al. disclose one or more sensors (sensors 34, Figs. 5 and 6) positioned adjacent to the flexible conduit to detect a fluid and air mixture therein (col. 4, lines 25-29).

Therefore, at the time of invention, it would have been obvious to a person of ordinary skill in the art to utilize sensors adjacent to the flexible conduit into the invention of Kimura et al. as modified by Shibata et al. The motivation for doing so, as taught by Hahs et al., is to detect voids in the ink flow (col. 1, lines 56-62).

Regarding claim 21:

Kimura et al. as modified by Shibata et al. disclose all claimed limitations except that the flexible conduit is transparent, and wherein the apparatus further includes a light emitting source and a light detector positioned opposite one another around the transparent flexible conduit.

However, Hahs et al. disclose a flexible conduit that is transparent (col. 4, lines 26-27), and wherein the printer further includes a light emitting source and a light detector positioned opposite one another around the transparent flexible conduit (col. 4, lines 24-25 and Fig. 6).

Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kimura et al. (US 6796627 B2) in view of Farr et al. (US 6874861 B2).

Regarding claim 25:

Kimura et al. disclose all the limitations of claim 23, as well as the limitation that the transfer and tracking module includes software to track ink volumes (col. 27, lines 16-18 and Fig. 16).

Kimura et al. do not expressly disclose that the ink volumes are tracked based on a pumping session from the supply tank to the print cartridge reservoir.

However, Farr et al. disclose tracking ink volumes based on a pumping session from the supply tank to the print cartridge reservoir (col. 13, lines 35-44).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to use Farr et al.'s ink volume tracking methods into the invention of Kimura et al. The motivation for doing so, as taught by Farr et al., is to determine characteristics of the printing fluid and a printing fluid level (col. 4, lines 2-10).

Allowable Subject Matter

Claims 6-11 and 13-16 are allowed.

Claims 6-11 are allowable since the prior art of record does not teach a method for refilling a print cartridge reservoir comprising the step of refilling the print cartridge reservoir

using a variable refill frequency in combination with the step of refilling occurs resulting from when a total volume remaining in the supply tank is equal to a volume which would refill the print cartridge reservoir to an initial fill level.

Claims 13-16 are allowable since the prior art of record does not teach a computer readable medium having a set of computer executable instructions thereon for causing a device to perform a method comprising the step of refilling the print cartridge reservoir on a variable refill frequency in combination with the step of refilling occurs resulting from when an ink volume consumed from the print cartridge reservoir since its last refill substantially equals a total ink volume remaining in the supply tank.

Response to Arguments

Applicant's arguments with respect to claims 1 and 17 have been considered but are moot in view of the new ground(s) of rejection. Please see the above rejection to Cowger et al. in view of Kimura et al., which discloses a method of refilling of the print cartridge reservoir from the supply tank resulting from when the ink volume in the supply tank substantially equals an ink volume to refill the print cartridge reservoir to a predetermined level.

Applicant's arguments with respect to claim 12 have been considered but are moot in view of the new ground(s) of rejection. Please see the above rejection to Cowger et al. in view of Kimura et al., which discloses a method of refilling of the print cartridge reservoir resulting from when a remaining ink volume available in the supply tank substantially equals an ink volume consumed since a previous ink cartridge reservoir refill.

Applicant's arguments with respect to claims 18 and 23 have been fully considered but they are not persuasive. Applicant argues that the Kimura et al. reference does not teach the

limitation that "transfer of ink from the supply tank to the print cartridge reservoir resulting from when a total ink volume remaining in the supply tank substantially equals an ink volume used to refill the print cartridge reservoir. However, please note the flowchart given in Figure 23 of the Kimura et al. reference. If the main tank has been determined to be empty (i.e. the total ink volume remaining in the main tank is *not equal* to a volume to refill the cartridge reservoir), a "replenishment stop flag" is set (step S51) which prevents any following occurrence of refilling (step S32). However, just before the "replenishment stop flag" is set, the main tank uses its total ink volume remaining to refill the cartridge reservoir as shown in steps S44-S51. Because the "replenishment stop flag" is checked before refilling processes begins, it can be said that the refilling occurs resulting from when the ink volume remaining in the main tank is substantially equal to the ink volume to refill the print cartridge.

Applicant's arguments with respect to claim 27 have been considered but are moot in view of the new ground(s) of rejection. Please see the above rejection to Cowger et al. in view of Kimura et al., which discloses a method of refilling of the print cartridge reservoir resulting from when an ink volume remaining in the supply tank substantially equals an ink volume to refill the print cartridge reservoir to a predetermined level.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Communication with the USPTO

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shelby Fidler whose telephone number is (571) 272-8455. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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